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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,720

04/13/2006

Per Sjodin

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EXAMINER

COX, ALEXIS K

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,720	<b>Applicant(s)</b> SJODIN ET AL.	
	<b>Examiner</b> ALEXIS K. COX	<b>Art Unit</b> 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 4/13/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 31-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/02/2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. In response to the Preliminary Amendment filed April 13, 2006, claims 1-30 have been cancelled and the newly added claims 31-60 are pending.

#### ***Specification***

2. The disclosure is objected to because of the following informalities: on page 1 of the specification, line 25, "including a number port channels" is grammatically incorrect. The examiner suggests alteration to "including a number of port channels". Additionally, on page 5 of the specification, it states "preferred embodiments of the method are defined in the dependent claims 20 to 30". As claims 20 to 30 have been cancelled, the examiner suggests alteration to "... are defined in dependent claims 50 to 60". Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 31, 33, 34, 37-41, 44, 47, 49, 51-55 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826).

Regarding claims 31, 33, 34, 37-41, 44 and 47, Fuerschbach et al teaches a plate heat exchanger (10, see column 4 lines 25-26; claims 31 and 49) comprising a number of heat exchanger plates (see column 2 lines 8-11; claims 31 and 49), which are arranged beside each other and connected to each other by means of a braze connection (see column 5, lines 15-16; claims 31 and 49) accomplished by means of a braze process (see column 6 lines 59-64; claim 34), wherein the heat exchanger plates are substantially manufactured in stainless steel (see column 6 lines 18-20; claims 31

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and 58) containing chromium, wherein the plate heat exchanger includes a number of port channels extending through at least some of the heat exchanger plates (40, 41, 40a, 41a, see column 5 lines 49-54; claims 31 and 49) including an outer heat exchanger plate, wherein one or more of the port channels are surrounded by a connection surface (22, see column 5 lines 49-50; claims 31 and 49) for connection of the one or more port channels to a pipe member (IH, OH, see column 5 lines 66-67; claims 31 and 49). Fuerschbach further teaches the connection member to be designed as a pipe nipple (see column 5 lines 66-67; claim 47). It is noted that Fuerschbach et al does not explicitly teach the connection surface to include a material to permit brazing of the pipe member to the connection surface in a more easy manner than to stainless steel, the material being more reduction susceptible than chromium dioxide. However, the method of Usui teaches the use of a connection surface between stainless steel and stainless steel or another metal (see column 2 lines 49-53; claim 31). Usui further teaches the material on the connection surface to be composed of "a copper base-tin alloy" (see column 2 line 30; claim 33). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the system of Fuerschbach et al using the brazing technique of Usui, as the brazing of Usui results in a stronger bond than traditional brazing methods. Further, regarding claims 31, 34-41, 44 and 47, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met since said claims are considered "product-by-process" type claims.

Regarding claims 49, 51-55 and 58, the structural requirements of the method of these claims is filled by the system of Fuerschbach et al when manufactured with the method of Usui, as shown above. Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach; claim 52) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach; claim 52). Additionally, the method of Fuerschbach et al as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64; claim 55) and applying the material for forming the connection surface during the braze process (claim 56).

6. Claims 35, 36 and 56 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and further in view of Wells (US Patent No. 3,675,311).

Regarding claims 35, 36 and 56, it is noted that Fuerschbach et al in view of Usui does not explicitly teach the material to be bound to the stainless steel by diffusion. However, the method Wells teaches the material of Fuerschbach et al in view of Usui to be bound to the stainless steel by diffusion (see column 1 lines 67-70; applies to claims 35, 36, and 56). Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Wells to modify the system of Fuerschbach et al in view of Usui in order to perform diffusion brazing, which results in a stronger joint strength.

7. Claims 32, 45, 46, 50, 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No.4,815,534) in view of Usui (US Patent No. 4,223,826) and further in view of Mizuhara (US Patent No. 4,497,772).

Regarding claims 32, 45, 46, 50, 59 and 60, it is noted that the system of Fuerschbach et al as constructed using the brazing method of Usui does not teach the use of a connection surface or member to be constructed of an alloy containing nickel. However, Mizuhara teaches 5-35% palladium, 20-84% copper, and 10-50% nickel as a brazing alloy (column 1, lines 59-65; claims 32, 45, 46, 50, 59, 60). Therefore, the substitution of the brazing alloy of Mizuhara would have been obvious to one of ordinary skill in the art at the time of the invention, as the brazing alloy of Mizuhara is structurally equivalent to that of Usui, and a simple substitution does not render a structure patentably distinct over an existing structure. Further regarding claims 32 and 45-46, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

8. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) further in view of Wells (US Patent No. 3,675,311) and furthermore in view of the Encyclopedia Britannica 15<sup>th</sup> edition brazing article.

Regarding claim 57, it is noted that the system and method of Fuerschbach et al in view of Usui does not teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui and further in view of Wells.

9. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and further in view of the Encyclopedia Britannica 15<sup>th</sup> edition brazing article.

Regarding claims 42 and 43, the system of Fuerschbach in view of Usui teaches the material to have been applied onto the primary surface by means of and during a braze process, as shown above (Claim 43). It is noted that the system and method of Fuerschbach et al in view of Usui does not teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article; claim 42), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use



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mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui. Further regarding claims 42 and 43, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

10. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and further in view of Blomgren (US Patent No. 6,016,865).

Regarding claim 48, it is noted that the system of Fuerschbach et al in view of Usui does not explicitly teach the use of a washer for the connecting member. However, Blomgren teaches the use of a washer (15, see column 4, lines 7-9) as a connection member, and wherein the washer is brazed to the heat exchanger of Blomgren. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the washer of Blomgren in the system of Fuerschbach et al in view of Usui as a connector in order to reduce material costs to the manufacturer of the heat exchanger, displacing them to the manufacturer of pipes and surrounding equipment. Further regarding claim 48, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kelley (US Patent No. 1,655,273) and Whitney (US Patent No. 1,685,657) teach a method of joining metals by coating stainless steel with copper prior to brazing it.

Gleisle et al (US Patent Application Publication No. 2001/0030043) teaches a brazed plate heat exchanger utilizing metal gaskets.

Rassmus et al (US Patent Application Publication No. 2004/0181941) teaches a method of brazing thin heat exchanging plates using a coating on stainless steel plates to enable easier brazing.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Friday 7:30a.m. to 5:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joe H. Cheng can be reached on 703-272-4433. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/  
7/21/08

/Joe H Cheng/  
Supervisory Patent Examiner  
Art Unit 4116